

**DEPARTMENT OF TRANSPORTATION****DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave. St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-016548**Date Inspected:** 27-Aug-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1000**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

A). Field Welding Erection Access Holes

B). Field Splice E3/E4

A). Field Welding Erection Access Holes

The QAI observed the continued Flux Cored Arc Welding (FCAW-G) of the erection access hole insert plate identified as Weld Number (WN): E3-PP9.3-W1, W3 and W4 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder Yao Xin Liang ID-7238 performed the welding of the fill passes on the Complete Joint Penetration (CJP) groove weld utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-3040B-1, Rev. 0. The WPS was also utilized by the QC inspector Steve McConnell as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as follows; 232 amps, 23.5 volts and the travel speed was measured at 251mm/m. The 1.4mm filler metal, manufactured by ESAB was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U4a. The minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The welding of the "A" face of the weld joint was completed during this shift.

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Later in the shift the QAI observed the welder Wai Katlai ID-2953 perform the welding of the fill passes on the CJP groove joints identified as E4-PP8.5-W3 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welding was performed utilizing the Flux Cored Arc Welding (FCAW-G) process as per the WPS identified as ABF-WPS-D15-3040B-1, Rev. 1 which was also used by the QC inspector Mike Johnson as a reference to monitor and verify the welding parameters. The welding parameters were observed and verified by the QAI as follows; 269 amps, 23.0 volts and travel speed was measured as 268mm/m. The welding was performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U2a-GF. The minimum preheat temperature of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

The QAI also observed the Shielded Metal Arc Welding (SMAW) of the erection access hole insert plate identified as Weld Number (WN): E4-PP9.3-W1, W2, W3 and W4 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welder James Zhen ID-6001 performed the welding of the root pass of the Complete Joint Penetration (CJP) utilizing the Welding Procedure Specification (WPS) ABF-WPS-D15-1050A, Rev. 1. The WPS was also utilized by the QC inspector Mike Johnson as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 124 amps by the QC inspector. The 3.2mm Lincoln electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The groove joint appeared to comply with the AWS joint designation identified as B-U4a. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

The QAI also observed the back grinding of the insert plates identified as E4-PP8.5-W2 and W3.

### B). Field Splice E3/E4

The QAI observed the welder, Hua Qiang Hwang ID-2930, performing the CJP welding on the longitudinal stiffener field splice identified as WN: 3E-4E-A-LS4. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. and the inspection was performed by the QC inspector John Pagliero utilizing the WPS as a reference and verified the DC welding parameters which were observed and recorded as 124 amps.

The welding of the longitudinal stiffeners was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The minimum preheat temperature of 100 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The interpass cleaning was performed utilizing a wire wheel attached to a 4" grinder to remove the slag. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified

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by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW and FCAW-G processes appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The digital photographs below illustrate the work observed during this scheduled shift.



### Summary of Conversations:

There were general conversations with Quality Control Inspector Mike Johnson and John Pagliero at the start of the shift regarding the location of American Bridge/Fluor welding personnel and inspection/ N.D.E. testing scheduled for this shift.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Reyes,Danny	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell,Bill	QA Reviewer

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